

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Methods in Mathematics

Unit 1: Methods 1

For Approved Pilot Centres ONLY

Higher Tier

Mock Paper

Time: 1 hour 45 minutes

Paper Reference

5MM1H/01

You must have:

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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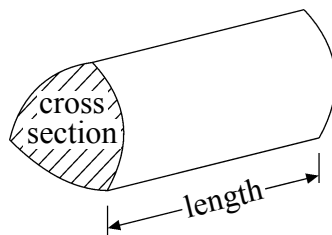
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GCSE Mathematics 2MM01

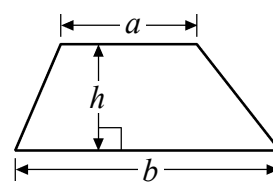
Formulae – Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section \times length

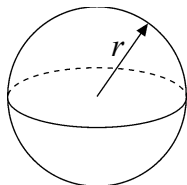


Area of trapezium = $\frac{1}{2}(a + b)h$



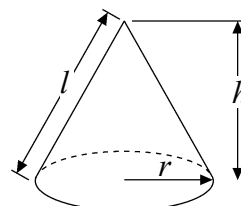
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

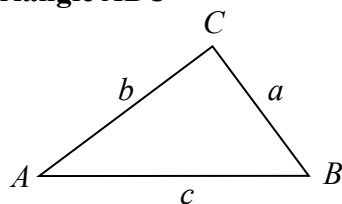


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Using the information that $2.6 \times 78 = 202.8$

write down the value of

(a) 26×78

.....
(1)

(b) 2600×7.8

.....
(1)

(c) $202.8 \div 26$

.....
(1)

(Total for Question 1 is 3 marks)

2 A bag contains counters which are red or green or yellow or blue.

The table shows each of the probabilities that a counter taken at random from the bag will be red or yellow or blue.

Colour	Red	Green	Yellow	Blue
Probability	0.1		0.2	0.3

A counter is to be taken at random from the bag.

(a) Work out the probability that the counter will be green.

.....
(2)

There are 30 counters in the bag.

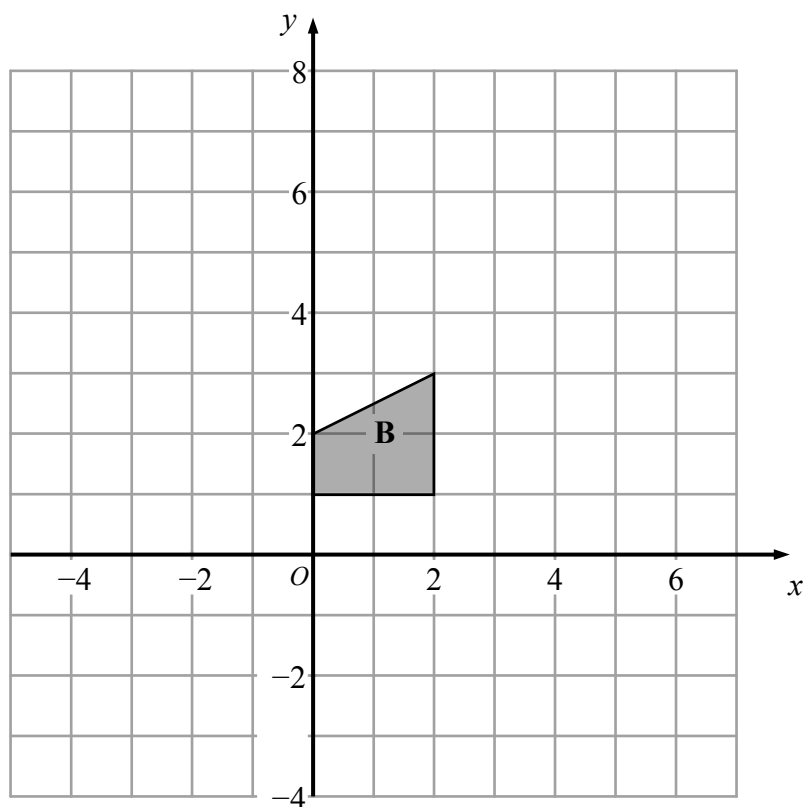
(b) Work out the number of yellow counters in the bag.

.....
(2)

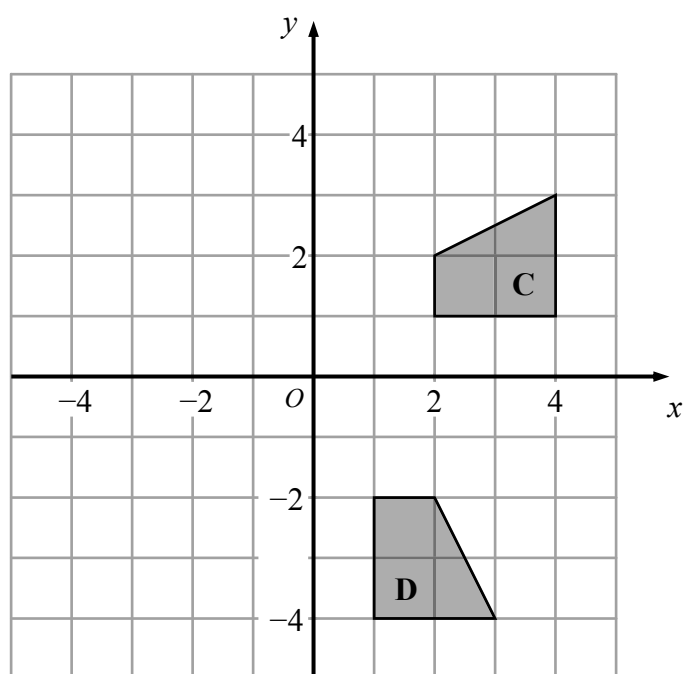
(Total for Question 2 is 4 marks)



3



- (a) On the grid, translate shape **B** by $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$. (1)



- (b) Describe fully the transformation that maps shape **C** onto shape **D**.

.....

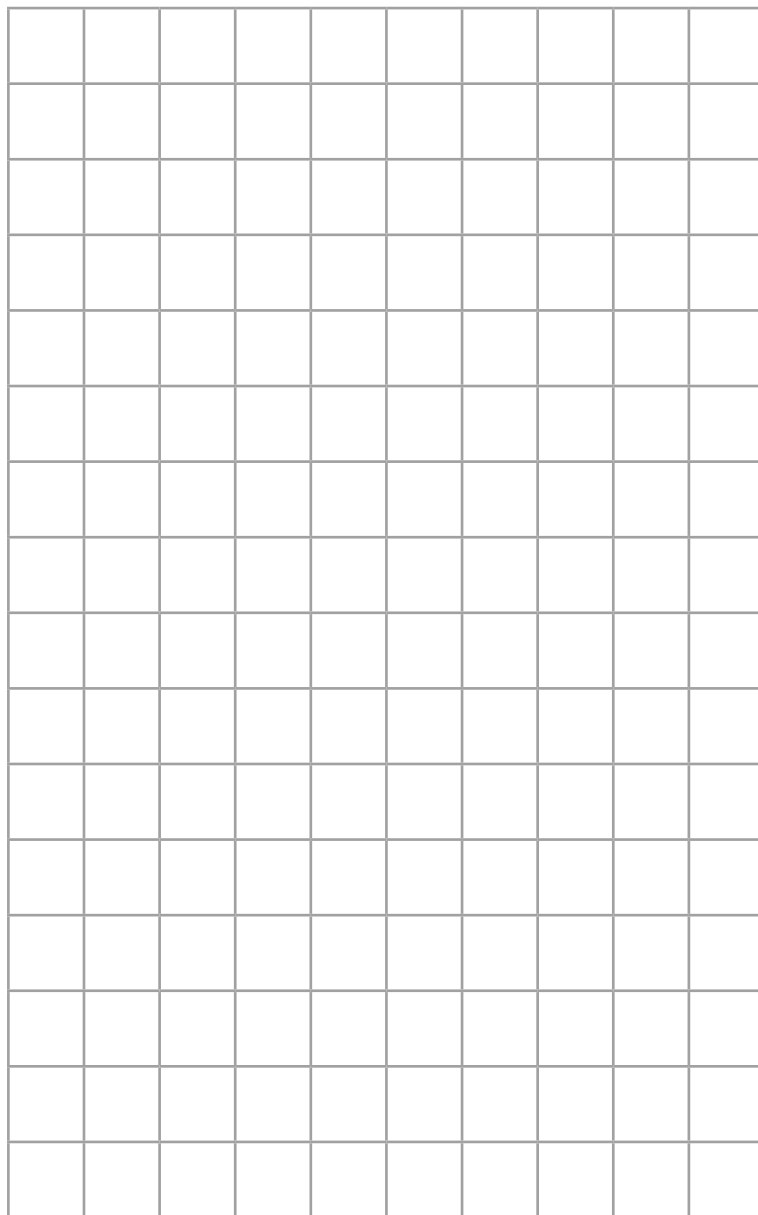
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(3)

(Total for Question 3 is 4 marks)



*4 On the grid, draw the graph of $y = 3x + 4$ for values of x from -2 to 2



(Total for Question 4 is 4 marks)



5 (a) Express 36 as a product of its prime factors.

(2)

(b) Find the Lowest Common Multiple (LCM) of 24 and 36

(2)

(Total for Question 5 is 4 marks)

6 (a) Work out $\frac{3}{7} \times \frac{2}{5}$

(1)

(b) Work out $6\frac{4}{5} - 1\frac{2}{3}$

(3)

(Total for Question 6 is 4 marks)



7 (a) Simplify $3(2x + 5y) + 2(x - 4y)$

.....
(2)

(b) Factorise fully $12g - 20$

.....
(2)

(c) Simplify $x^7 \times x^4$

.....
(1)

(d) Simplify fully $\frac{24x^5y^9}{6xy^2}$

.....
(2)

(e) Expand and simplify $(t + 9)(t + 2)$

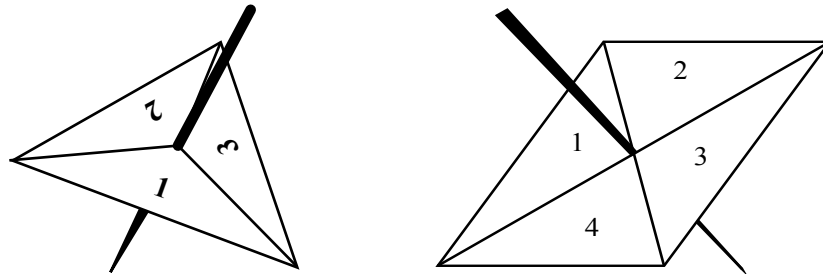
.....
(2)

(Total for Question 7 is 9 marks)



W 3 9 7 3 6 A 0 7 1 8

8 Jerry has a fair 3-sided spinner and a fair 4-sided spinner.



The sides of the 3-sided spinner are labelled 1, 2, 3
 The sides of the 4-sided spinner are labelled 1, 2, 3, 4

Jerry spins each spinner once.
 Each spinner lands on a number.
 To get the score he adds the two numbers together.

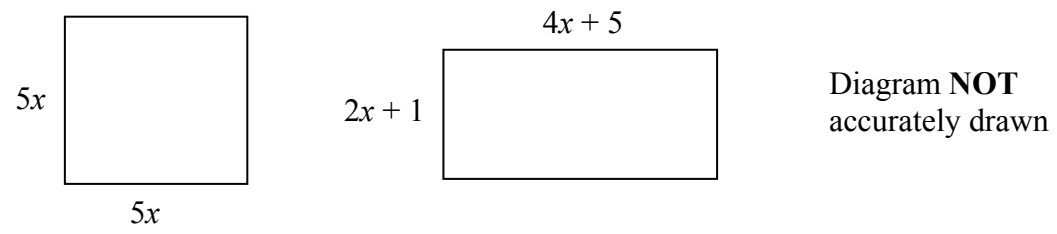
(i) Work out the probability that the score will be 4

(ii) Work out the probability that the score will be less than 5

(Total for Question 8 is 5 marks)



- 9 The diagram shows a square and a rectangle.



All measurements are given in centimetres.

The perimeter of the square is the same as the perimeter of the rectangle.

Work out the **area** of the rectangle.

..... cm^2

(Total for Question 9 is 5 marks)



10 Here is some information about some students in a class.

- There are 36 students in the class.
- 28 of the students have brown hair.
- 7 of the students have brown hair and wear glasses.
- 3 of the students do **not** have brown hair and do **not** wear glasses.

(a) Draw a Venn diagram to show this information.

(4)

A student is chosen at random from the class.

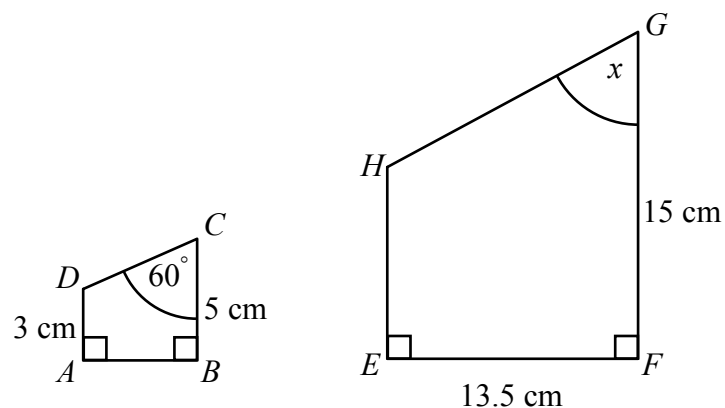
(b) Work out the probability that this student has brown hair but does **not** wear glasses.

(2)

(Total for Question 10 is 6 marks)



11 Trapeziums $ABCD$ and $EFGH$ are mathematically similar.



Diagrams **NOT**
accurately drawn

(a) Write down the size of the angle marked x .

$x = \dots\dots\dots^\circ$
(1)

(b) Work out the length of EH .

$\dots\dots\dots$ cm
(2)

(c) Work out the length of AB .

$\dots\dots\dots$ cm
(2)

(Total for Question 11 is 5 marks)

12 (a) (i) Write 60 000 in standard form.

$\dots\dots\dots$

(ii) Write 8.2×10^{-3} as an ordinary number.

$\dots\dots\dots$
(2)

(b) Work out the value of $3 \times 10^6 \times 4 \times 10^5$
Give your answer in standard form.

$\dots\dots\dots$
(2)

(Total for Question 12 is 4 marks)



13 (a) Solve $5x - 3 = 2x + 19$

.....
(2)

(b) Solve $y^2 - 5y - 14 = 0$

.....
(3)

(Total for Question 13 is 5 marks)

14 (a) Write down the value of 50

.....
(1)

(b) Write down the value of $64^{\frac{1}{3}}$

.....
(1)

(c) $\sqrt{27} = \frac{3^n}{9}$

Find the value of n .

.....
(3)

(Total for Question 14 is 5 marks)



15 (a) Factorise fully $27x^2y - 36xy^3$

.....
(2)

(b) Simplify $\frac{3(x+2)}{(x+2)^2}$

.....
(1)

(c) Factorise $6x^2 - 7x - 5$

.....
(2)

(d) Solve $\frac{(2x-1)}{3} + \frac{(x+3)}{2} = \frac{5}{6}$

$x =$
(4)

(Total for Question 15 is 9 marks)



*16

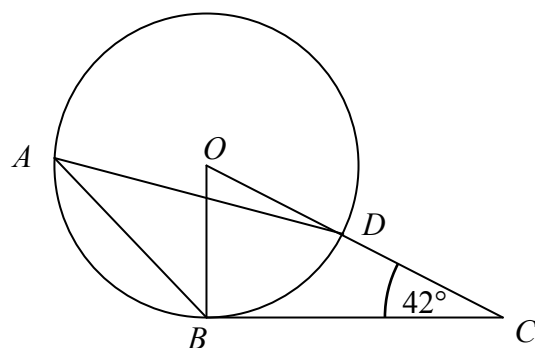


Diagram **NOT**
accurately drawn

A , B and D are points on the circumference of a circle, centre O .

ODC is a straight line.

CB is a tangent to the circle.

Angle $OCB = 42^\circ$

Work out the size of angle BAD .

Give reasons for your answer.

(Total for Question 16 is 5 marks)



***17** Prove that the sum of three consecutive even numbers is always a multiple of 6

(Total for Question 17 is 3 marks)



W 3 9 7 3 6 A 0 1 5 1 8

18 Graham has 10 counters in a bag.

- 3 of the counters are orange.
- 2 of the counters are red.
- 5 of the counters are yellow.

Graham takes at random **two** counters from the bag and puts them both in a box.

Work out the probability that the counters will **not** both be the same colour.

(Total for Question 18 is 4 marks)



19

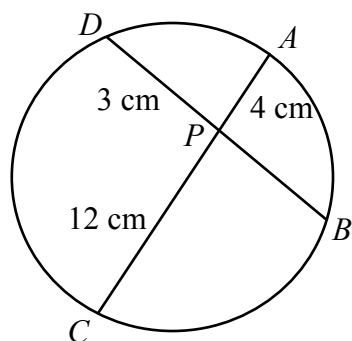


Diagram **NOT**
accurately drawn

AC and BD are chords of a circle.
 AC and BD intersect at the point P .

$AP = 4$ cm.
 $CP = 12$ cm.
 $DP = 3$ cm.

Work out the length of BP .

..... cm

(Total for Question 19 is 2 marks)

20 Here is a right-angled triangle.

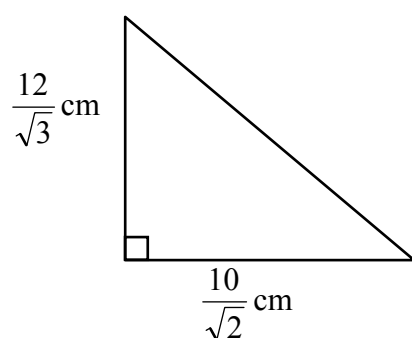


Diagram **NOT**
accurately drawn

Work out the area of the triangle.
Give your answer in the form $a\sqrt{b}$, where a and b are integers.

..... cm²

(Total for Question 20 is 3 marks)



21

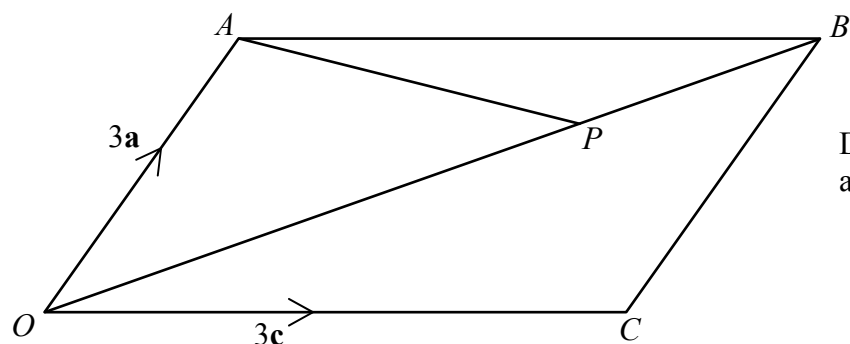


Diagram **NOT**
accurately drawn

$OABC$ is a parallelogram.

P is the point on OB such that $OP : PB = 2 : 1$

$$\overrightarrow{OA} = 3\mathbf{a}.$$

$$\overrightarrow{OC} = 3\mathbf{c}.$$

- (a) (i) Find the vector \overrightarrow{OB}

Give your answer in terms of \mathbf{a} and \mathbf{c} in its simplest form.

.....

- (ii) Find the vector \overrightarrow{AP}

Give your answer in terms of \mathbf{a} and \mathbf{c} in its simplest form.

.....

(4)

The midpoint of CB is M .

- * (b) Prove that APM is a straight line.

(3)

(Total for Question 21 is 7 marks)

TOTAL FOR PAPER IS 100 MARKS

